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Final Letter Report

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ELECTRONIC HOUSE CALL PHASE IIB PLANNING

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ELECTRONIC HOUSE CALL PHASE IIB PLANNING

Final Letter Report
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Under this research project with the Medical College of Georgia, plans were developed to add a variety of new features to enhance the capabilities of the Electronic House Call system. The long-range goal is to create a flexible Electronic House Call system that supports a wide variety of diagnostic devices, communications pathways, user interfaces, database systems, and video/audio conferencing equipment. Under this planning project, the goals were refined and specific tasks were identified to achieve the goal. The tasks that were identified as part of this planning project are summarized below.

Tasks were identified that would expand the EHC to operate in different modes, over a variety of communication links, and in lower cost configurations. An important design change from the original EHC is the plan for a new client/server database structure. Plans were also identified to reduce the dependence on Intel ProShare, to add ISDN and POTS capabilities, and to add the capability for several new medical devices. The specific tasks in the plan included: 1) developing a client/server database structure for the EHC, 2) providing support for ISDN and POTS, 3) upgrading the user interface, 4) developing a reduced cost version of the EHC that uses a television for the patient monitor, 5) adding two new medical devices, and 6) providing demonstrations of the new EHC capabilities and the future potential of a more scalable telemedicine platform. The details for the specific tasks are provided below:

Client/Server Database

A new client/server database structure should be developed to support remote access to patient data by an authorized user from any computer. The original EHC prototype transferred patient data between local database applications using the proprietary ProShare data path. This approach precluded using other video conferencing products, and it required that the doctor or nurse come to the central monitoring station to view the patient data on the local database. The client/server database structure creates a central database that can be accessed from anywhere through network connections or dial-up modem connections. The client/server structure also lays the foundation for Internet support and a web-based interface for the patient and provider stations in the future.

ISDN and POTS Support

The EHC system should be expanded to support both ISDN and regular telephone service (POTS). The original EHC systems deployed in patient homes in Augusta were connected in a local area network through cable modems on the Jones InterCable system. Intel ProShare videoconferencing can support ISDN through a hardware upgrade, and the new EHC should include software to work with the ISDN version of ProShare. Another goal is to support limited operation of the EHC system over regular telephone connections. To be responsive to medical

needs of the patient, telemedicine applications must be available as soon as that monitoring is ordered by the healthcare provider. For patients requiring an ISDN or network connection, there is often a waiting period of days to weeks for installation of these communications links. With some modifications, the EHC system can be upgraded to support immediate data communications over a regular telephone line. In this mode, the patient could begin vital signs monitoring, and this data would be transferred to the central database over the patient's regular telephone phone line. The patient could later add interactive video conferencing when ISDN or network connections became available. This planning task should also include other types of video conferencing options, including POTS videoconferencing products.

Upgrade User Interface

A planning task to redesign both the patient and provider station user interfaces was identified. The patient side should be able to accommodate different device configurations and it should be designed to work within the resolution limitations of a standard television. To support this, software tools are needed to add and remove medical device options - and their associated menu/buttons - from the patient display. On the central monitoring station (CMS), the windows interface should be upgraded to allow the provider to enter data directly, and to make the camera controls always visible on the menu bar. In addition, new software should be developed to allow a provider to access patient data from any computer with a modem or network connection to the central database. This option is made possible by the client/server database structure, and it will eliminate the requirement that the doctor or nurse must go to the CMS to see the patient data. This task involves writing a client application that logs into the EHC database, extracts patient data according to user specified criteria, and displays the results on the client system.

Low-Cost Configuration for Television

A practical goal for the EHC is to reduce the cost by eliminating some of the more expensive components of the original system. It is likely that home entertainment systems will soon include computer and multimedia components that are today considered expensive options for high end computer systems. The convergence of home entertainment products with computer and communications technologies will support a strong cost-effective foundation for home health applications. However, health economics today demand immediate attention to the cost of technology, and there are a variety of ways to reduce the off-the-shelf cost of an EHC system without sacrificing the primary system capabilities. One of the more expensive components of the original EHC is the ELO touch screen monitor. This technology simplifies the user interface, but a version of the EHC that utilizes the home television may provide an adequate and much more affordable solution. The new patient interface screen should be designed to work on a television with alternative input control devices to the touch screen. The plan should include tasks to evaluate a remote control mouse, a trackball, and a joystick as well as to explore the possibility of migrating the EHC system to "Web TV".

New Medical Devices

Enhancement of the EHC should include adding new medical devices. Two devices in particular will enhance the monitoring capabilities of the system. These include a spirometer and a blood glucose monitor. These new devices will support two large patient populations: patients with diabetes and patients with asthma.

Demonstrations

A final task identified as part of this planning project was a demonstration plan. A set of demonstration was identified to illustrate the enhanced EHC capabilities and to present the expanded potential of the scalable and more flexible telemedicine platform. The demonstration plans included:

A. Off-line measurements transferred from the patient EHC to the CMS over POTS.
B. CMS laptop access to the patient EHC data over POTS.
C. Low cost patient system with TV replacing expensive touch screen monitor.
D. Demonstrate GSTP consultation over EHC.
E. Consultation from GSTP patient site to EHC central monitoring station
F. Consultation from GSTP consultant site to EHC patient in the home.

SUMMARY

Under this project with the Medical College of Georgia, plans were developed to add a variety of new features to enhance the capabilities of the Electronic House Call system. The plans were developed as the set of tasks described above.